IN THE CLAIMS

1.   (Original) A method, comprising:

performing a first process on at least one semiconductor wafer;

acquiring data on at least one of a real-time basis and a near real-time basis, said data

comprising at least one of a process state data, a tool state data, and an integrated

metrology data resulting from said first processing of semiconductor wafer;

storing said data in a database; and

performing a fault detection analysis based upon said data acquired from said database

based upon a trigger signal that causes data to be extracted from said database on

a substantially real time basis.

2.   (Original) The method described in claim 1, further comprising performing a

second process on a semiconductor wafer based upon processing modifications made in response

to said fault detection.

3.   (Original) The method described in claim 1, wherein acquiring metrology data

resulting from said first process of semiconductor wafer further comprises acquiring integrated

metrology data using an integrated metrology tool.

4.   (Original) The method described in claim 1, wherein acquiring metrology data

resulting from said first process of semiconductor wafer further comprises acquiring offline

metrology data using an offline metrology tool.

5. (Original) The method described in claim 1, wherein storing said data in a database further comprises:

receiving data collection instructions from a data collection model, said data collection model based upon at least one business rule;

acquiring data incoming into the database based upon said collection instructions;

storing said incoming data into a storage unit in said database; and

processing said stored data in said database, said processing comprising at least one of combining, merging, expanding, and contracting at least portions of said data acquired by said database.

6. (Original) The method described in claim 5, wherein expanding said data further comprises attaching a process state data with a corresponding tool state data.

7. (Previously presented) The method described in claim 1, wherein performing a fault detection analysis based upon said data acquired from said database on one of a real-time basis and a near real-time basis further comprises:

triggering said database for extracting said data;

analyzing said data triggered from said database;

detecting a fault based upon said analysis of said triggered data; and

performing a fault compensation process in response to a determination that a calculated fault is above a predetermined tolerance level.

8. (Original) The method described in claim 7, wherein triggering said database for extracting said data further comprises providing a triggering signal to said database to extract said data from said database.

9. (Original) The method described in claim 8, wherein triggering said database for extracting said data further comprises triggering said database at a rate that is substantially same as a rate of data flow into said database.

10. (Original) The method described in claim 8, wherein triggering said database for extracting said data further comprises triggering said database at a rate that is lower than the rate of data flow into said database.

11. (Original) The method described in claim 1, wherein storing said data in a database further comprises storing said data in a real-time database.

12. (Previously presented) A method, comprising:

performing a first process on at least one semiconductor wafer;

acquiring data comprising at least one of a process state data, a tool state data, and a metrology data resulting from said first process of semiconductor wafer on a substantially real-time basis;

storing said data in a database;

extracting said data from said database based upon a trigger signal directed to said database, said trigger signal being capable of extracting said data from said

database at a substantially real-time rate;

performing a fault detection analysis based upon said extracted data acquired from said database; and

performing a second process on a semiconductor wafer based upon processing modifications made in response to said fault detection.

13. (Original) The method described in claim 12, wherein storing said data in a database further comprises:

receiving data collection instructions from a data collection model, said data collection model based upon at least one business rule;

acquiring data incoming into the database based upon said collection instructions;

storing said incoming data into a storage unit in said database; and

processing said stored data in said database, said processing comprising at least one of combining, merging, expanding, and contracting at least portions of said data acquired by said database.

14. (Original) The method described in claim 12, wherein triggering said database for extracting said data further comprises triggering said database at a rate that is lower than the rate of data flow into said database.

15. (Original) An apparatus, comprising:

means for performing a first process on at least one semiconductor wafer;

means for acquiring data on at least one of a real-time basis and a near real-time basis,

said data comprising at least one of a process state data, a tool state data, and an integrated metrology data resulting from said first processing of semiconductor wafer;

means for storing said data in a database; and

means for performing a fault detection analysis based upon said data acquired from said database based upon a trigger signal that causes data to be extracted from said database on a substantially real time basis.

16.   (Original) A system, comprising:

a process controller to perform a fault detection using substantially real-time data from a database, said fault detection comprising:

performing a first process on at least one semiconductor wafer;

acquiring data on at least one of a real-time basis and a near real-time basis, said data comprising at least one of a process state data, a tool state data, and an integrated metrology data resulting from said first processing of semiconductor wafer;

storing said data in a database;

performing a fault detection analysis based upon said data acquired from said database based upon a trigger signal that causes data to be extracted from said database on a substantially real time basis; and

a database operatively coupled to said process controller, said database to acquire said data in a substantially real-time basis and to provide said processed data to said process controller for performing said fault detection.

17.   (Original) The system of claim 16, further comprising:

a computer system operatively coupled with said database, said computer system to perform at least one calculation for performing said fault detection;

a manufacturing model operatively coupled with said computer system, said manufacturing model to generate and modify at least one control input parameter signal based upon said fault detection;

a machine interface operatively coupled with said manufacturing model, said machine interface being capable of receiving process recipes from said manufacturing model;

a processing tool capable of processing semiconductor wafers and operatively coupled with said machine interface and said database, said processing tool to receive at least one control input parameter signal from said machine interface and to provide substantial real-time data to said database;

an integrated metrology tool integrated with said processing tool, said integrated metrology tool to acquire said integrated metrology data and sending said integrated metrology data to said database; and

a fault detection analysis unit operatively coupled to said computer system and said database, said fault detection analysis unit to acquire said data from said database based upon a trigger signal and to perform fault detection analysis data to said computer system for said fault detection calculation.

18.   (Original) The system of claim 17, wherein said computer system is capable of generating modification data for modifying at least one parameter in said manufacturing model in

response to said fault detection analysis.

19.   (Original)   The system of claim 17, wherein said integrated metrology tool is located within said processing tool.

20.   (Original) A computer readable program storage device encoded with instructions that, when executed by a computer, performs a method, comprising:

performing a first process on at least one semiconductor wafer;

acquiring data on at least one of a real-time basis and a near real-time basis, said data

comprising at least one of a process state data, a tool state data, and an integrated

metrology data resulting from said first processing of semiconductor wafer;

storing said data in a database; and

performing a fault detection analysis based upon said data acquired from said database

based upon a trigger signal that causes data to be extracted from said database on

a substantially real time basis.

21.   (Original)   The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 20, the method further comprising performing a second process on a semiconductor wafer based upon processing modifications made in response to said fault detection.

22.   (Original)   The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 20,

wherein acquiring metrology data resulting from said first process of semiconductor wafer further comprises acquiring integrated metrology data using an integrated metrology tool.

23.   (Original)   The computer readable program storage device encoded with instructions that, when. executed by a computer, performs the method described in claim 20, wherein acquiring metrology data resulting from said first process of semiconductor wafer further comprises acquiring offline metrology data using an offline metrology tool.

24.   (Original)   The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 20, wherein storing said data in a database further comprises:

   receiving data collection instructions from a data collection model, said data collection
   model based upon at least one business rule;

   acquiring data incoming into the database based upon said collection instructions;

   storing said incoming data into a storage unit in said database; and

   processing said stored data in said database, said processing comprising at least one of
   combining, merging, expanding, and contracting at least portions of said data
   acquired by said database.

25.   (Original)   The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 24, wherein expanding said data further comprises attaching a process state data with a corresponding tool state data.

26. (Previously presented) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 20, wherein performing a fault detection analysis based upon said data acquired from said database on one of a real-time basis and a near real-time basis further comprises:

triggering said database for extracting said data;

analyzing said data triggered from said database;

detecting a fault based upon said analysis of said triggered data; and

performing a fault compensation process in response to a determination that a calculated fault is above a predetermined tolerance level.

27. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 26, wherein triggering said database for extracting said data further comprises providing a triggering signal to said database to extract said data from said database.

28. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 27, wherein triggering said database for extracting said data further comprises triggering said database at a rate that is substantially same as a rate of data flow into said database.

29. (Original) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 27,

wherein triggering said database for extracting said data further comprises triggering said database at a rate that is lower than the rate of data flow into said database.

30.   (Original)   The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 20, wherein storing said data in a database further comprises storing said data in a real-time database.

31.   (New) A method, comprising:

performing a first process on at least one semiconductor wafer;

acquiring data on at least one of a real-time basis and a near real-time basis, said data comprising at least one of a process state data, a tool state data, an integrated metrology data, and an offline metrology data resulting from said first processing of semiconductor wafer;

storing said data in a database; and

performing a fault detection analysis based upon said data acquired from said database based upon a trigger signal that causes data to be extracted from said database on a substantially real time basis.

32.   (New) The method described in claim 31, wherein storing said data in a database further comprises:

receiving data collection instructions from a data collection model, said data collection model based upon at least one business rule;

acquiring data incoming into the database based upon said collection instructions;

storing said incoming data into a storage unit in said database; and

processing said stored data in said database, said processing comprising at least one of

combining, merging, expanding, and contracting at least portions of said data

acquired by said database.

33.   (New)   The method described in claim 32, wherein expanding said data further comprises attaching a process state data with a corresponding tool state data.

34.   (New)   The method described in claim 31, wherein performing a fault detection analysis based upon said data acquired from said database on one of a real-time basis and a near real-time basis further comprises:

triggering said database for extracting said data;

analyzing said data triggered from said database;

detecting a fault based upon said analysis of said triggered data; and

performing a fault compensation process in response to a determination that a calculated

fault is above a predetermined tolerance level.

35.   (New)   The method described in claim 34, wherein triggering said database for extracting said data further comprises providing a triggering signal to said database to extract said data from said database.

36.   (New)   The method described in claim 34, wherein triggering said database for extracting said data further comprises triggering said database at a rate that is substantially same

as a rate of data flow into said database.

37.   (New) A computer readable program storage device encoded with instructions that, when executed by a computer, performs a method, comprising:

performing a first process on at least one semiconductor wafer;

acquiring data on at least one of a real-time basis and a near real-time basis, said data comprising at least one of a process state data, a tool state data, an integrated metrology data, and an offline metrology data resulting from said first processing of semiconductor wafer;

storing said data in a database; and

performing a fault detection analysis based upon said data acquired from said database based upon a trigger signal that causes data to be extracted from said database on a substantially real time basis.

38.   (New) The computer readable program storage device encoded with instructions that, when executed by a computer, performs the method described in claim 37, wherein performing a fault detection analysis based upon said data acquired from said database on one of a real-time basis and a near real-time basis further comprises:

triggering said database for extracting said data;

analyzing said data triggered from said database;

detecting a fault based upon said analysis of said triggered data; and

performing a fault compensation process in response to a determination that a calculated fault is above a predetermined tolerance level.

Serial No. 10/044,340